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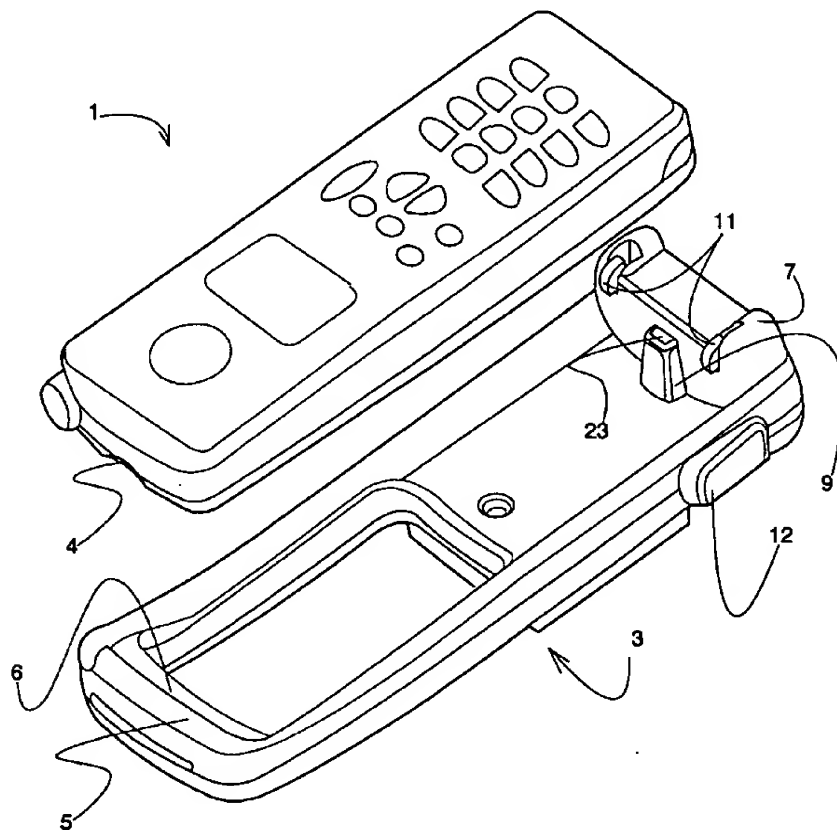
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**(54) Rack**

(57) The invention relates to a rack for an electronic handset, such as a mobile phone. The rack has at opposite ends three locking points (6,11) by which the handset is attached to the rack. At least one point (11)

has a spring-loaded locking latch. The rack can be used e.g. to attach a phone to the dashboard of a car. In the rack, the handset stays securely in its place also in motion.



**Fig. 2**

**EP 0 751 043 A1**

## Description

### TECHNICAL FIELD

The invention relates to electronic devices, such as mobile phones, and pertains to a rack having attachment means to hold a device in its place in the rack. The invention can be used e.g. to attach a phone to the dashboard of a car.

### BACKGROUND OF THE INVENTION

Together with a mobile phone it is often used a rack into which the phone can be placed. The rack can be attached e.g. to the dashboard of a car. Usually the device also includes some kind of locking means to hold the phone in its place also in motion.

To enable attachment of different phones in one and the same rack, the phones have to be of the same shape, which limits the number of designs. Alternatively, there has to be a rack for each different model, which increases costs.

It is known, e.g. from FI-patent 89650 (Nokia Matkapuhelimet Oy), a mobile phone rack having different models for phones with different shapes. The rack includes attachment means that press the phone from the sides.

### DESCRIPTION OF THE INVENTION

#### General description

Now it has been invented a rack according to claim 1. The preferred embodiments of the invention are presented in the other claims.

The rack according to the invention has one locking point at one end and two locking points at the other end to attach a handset to the rack. At least one locking point has a spring-loaded latch to lock the handset into the rack. The best way to attach the handset is to lock it so that it can be removed from the rack only when the locking is released.

The invention is also directed to a locking system. It includes locking elements, such as hooks or the like, which can move in the rack and clutch the handset and force-lock the handset securely into the rack.

Handsets of various shapes can be inserted in the rack as long as they have counterparts that meet the support points. Manufacturing of racks becomes cheaper and simpler when one and the same rack can serve different handsets. Yet the rack is simple, reliable and easy to use.

#### Drawings

The accompanying drawings are part of the detailed description of the invention. In the drawings

- Fig. 1 is a side view of the rack and a phone inserted in it,
- Fig. 2 shows the rack and a phone inserted in it as seen from the top end at an angle,
- Fig. 3 shows the rack and a phone inserted in it as seen from the bottom end at an angle, and
- Fig. 4 is an exploded view of the rack.

#### Detailed description

The phone 1 according to Fig. 1 has a body part and a battery 2 on its rear side. The phone is attached to a rack 3 the rear side against the front side of the rack. The rack can be attached by its rear side to the dashboard of a car, for example.

At the top end of the phone 1 there is an upper cavity 4. At the top end of the rack 3 there is a forward projection 5 and on its lower surface an upper nose 6 the shape of which corresponds to the cavity, so that the nose is placed in the cavity when the phone is in its place in the rack. In the application illustrated, the cavity is a transversal conical groove and the nose a ridge corresponding to it. At the lower end of the rack there is a protruding support 7 against which the lower end of the phone is placed.

At the lower end of the phone there is a guide groove 8 perpendicular to the rack 3 which becomes slightly wider towards the edge of the phone. At the lower end of the rack there is a guide nose 9 of the corresponding shape, so that the guide nose is placed in the guide groove when the phone is inserted in its place in the rack. The front end of the guide nose is open and in it there operates a push element described below.

At the lower end of the phone there is also on both sides of the guide groove 8 a locking cavity 10 extending into the phone in the vertical direction. At the lower end of the rack there are spring-loaded locking hooks 11 which meet the locking cavities and press the phone in the rack clearance-free against the upper nose 6 and guide nose 9 of the rack 3. On the sides of the rack there are release buttons 12 which release the locking hooks from the locking cavities of the phone when pressed.

The rack 3 has a rear cover 13 and a front cover 14. In the upper part of the rack there is an opening. The covers are fastened to each other with screws. The locking mechanism is inside the lower part of the rack.

In the upper front corners on both sides of the support 7 at the lower end of the rack there are holes 15 through which the locking hooks 11 rise to the locking cavities 10 at the lower end of the phone 1. The locking hooks protrude upwards from a slide 16. On both sides of the slide there are a front pin 17 and a rear pin 18 pointing to the side. On the inner side surfaces of the support there are grooves in which these pins slide. A groove has a horizontal part and in the front end of that part there is a lower branch which runs obliquely downward. The slide is pushed forward by two springs 19. When the slide is in its front position, the front pin is at

the lower end of the lower branch and the locking hooks are inside the support. When the front pin is in the horizontal part of the groove, the hooks are outside the upper surface of the support and cannot be pressed down at that position.

On top of the slide 16 there is a push element 20. It is pressed forward by a spring 21 with an O-ring 22 between them. The push element is the shape of the guide nose 9 and the front end of the push element comes through the hole in the front edge of the nose. At the front end of the push element there is an elastic cover 23. On the lower surface of the push element there is a claw, and on the upper surface of the slide there is a projection 24 which meets that claw. When the push element is in its front position, the claw is located in front of the projection. When the push element is pressed, the claw catches the projection and forces the slide to follow the push element.

The release buttons 12 have shanks 25 pointing inward and to each other, and the ends of the shanks meet each other forming a hinge 26. The ends are shaped such that when either of the release buttons is pressed, both shanks move downward. The shanks are pulled to each other and to their horizontal position by a spring 27. The ends of the shanks form a transversal latch claw 28 protruding upward. It is met by the latch groove 29 in the slide.

A phone 1 is inserted in the rack 3 as follows: first, the upper cavity 4 of the phone is pushed onto the upper nose 6 of the rack and then the lower end of the phone is pressed against the rack. Then the guide groove 8 at the lower end of the phone hits the push element 20 which starts to move backward. The claw of the push element catches the slide 16 which follows the push element, whereby the locking hooks 11 are lifted into the locking cavities of the phone. When the push element and slide reach their rear position the latch groove 29 of the slide meets the latch claw 28 thus locking the phone securely into its place. The phone is pressed, clearance-free, against the locking hooks and upper nose. The phone will not come off accidentally e.g. in a collision, unless the collision is so strong that the device gets broken.

When the user wishes to remove the phone 1 from the rack 3, he presses the release buttons 12, whereby the elements of the latch claw 28 move downward together with the shanks 25 thus releasing the slide 16. Then the slide and push element 20 are free to move forward and the locking hooks 11 come off the phone and are lowered inside the support 7.

The locking system disclosed is simple, reliable and easy to use. The phone is held in its place in the rack independent of the position of the rack.

#### Claims

1. A rack for an electronic handset which, ie. the hand-

set, has an upper end and a lower end and which rack has a space with an upper end and a lower end and in which space the handset can be inserted, **characterized** in that the rack has at one end a point of attachment (6) and at the opposite end two points of attachment (11) which are attached to counterparts at the corresponding locations in a handset inserted in the rack thus holding the handset in its place in the rack, and at least one of the points of attachment has a spring-loaded latch (11) which catches a latch counterpart in a handset when the handset is inserted in the rack and which can be released when the user wishes to remove the handset from the rack.

2. The rack of claim 1, **characterized** in that the points of attachment (6, 11) have projections or hollows which meet the hollows or projections at the corresponding locations in a handset.

3. The rack of claim 1 or 2, **characterized** in that there are projections in the points of attachment (6, 11).

4. The rack of claim 3, **characterized** in that there is one projection (6) at one end of the rack and two projections at the other end.

5. The rack of claim 4, **characterized** in that there is one projection (6) at the upper end of the rack and two protruding spring-loaded latches (11) at the lower end.

6. The rack of any one of claims 1 to 5, **characterized** in that it includes a force-locking latch (11).

7. The rack of any one of claims 1 to 6, **characterized** in that at one end of the rack there is also a guide element (9) to guide the handset into its attachment position.

8. The rack of claim 7, **characterized** in that the guide element (9) is a nose or groove perpendicular to the rack.

9. A mobile phone rack according to any one of claims 1 to 8.

10. An electronic handset which has an upper end and a lower end and which can be inserted in a rack that has an upper end and a lower end, **characterized** in that the handset has at one end a counterpart (4) and at the opposite end two counterparts (10) which are attached to the points of attachment (6, 11) at corresponding locations in the rack when the handset is inserted in the rack, and at least one of the points of attachment includes a spring-loaded latch (11) which clutches a latch counterpart in the handset when the handset is placed in the rack and

which can be released when the user wants to remove the handset from the rack.

11. A battery for an electronic handset, which handset has an upper end and a lower end and which can be inserted in a rack that has an upper end and a lower end, **characterized** in that the battery has at least one counterpart (10) which is attached to one of the three points of attachment in the rack, one (6) of which is located at one end of the rack and two (11) of which at the opposite end of the rack and at least one point of attachment has a spring-loaded latch (11) which clutches a latch counterpart (10) in the handset or in its battery when the handset is placed in the rack and which can be released when the user wants to remove the handset from the rack.
12. An electronic handset and its rack, which handset has an upper end and a lower end and which rack has a space with an upper end and a lower end and in which space the handset can be inserted, **characterized** in that the rack has at one end a point of attachment (6) and at the opposite end two points of attachment (11) and that the handset has at the corresponding locations counterparts which the points of attachment meet when the handset is inserted in the rack, and at least one of the points of attachment has a spring-loaded latch (11) which clutches the handset when the handset is inserted in the rack and which can be released when the user wants to remove the handset from the rack.

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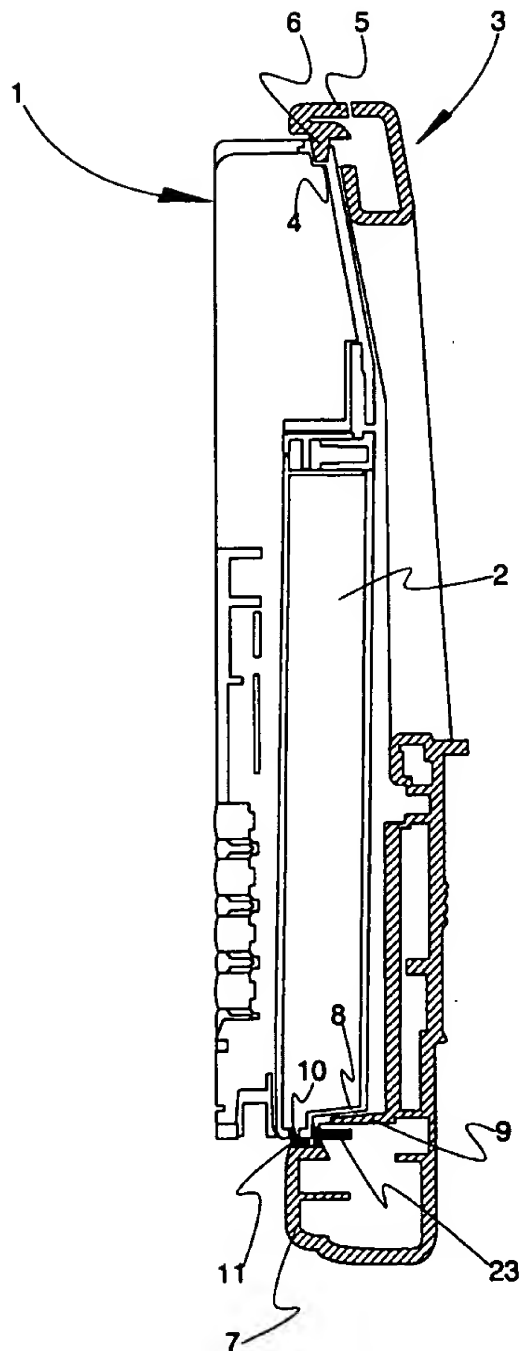


Fig. 1

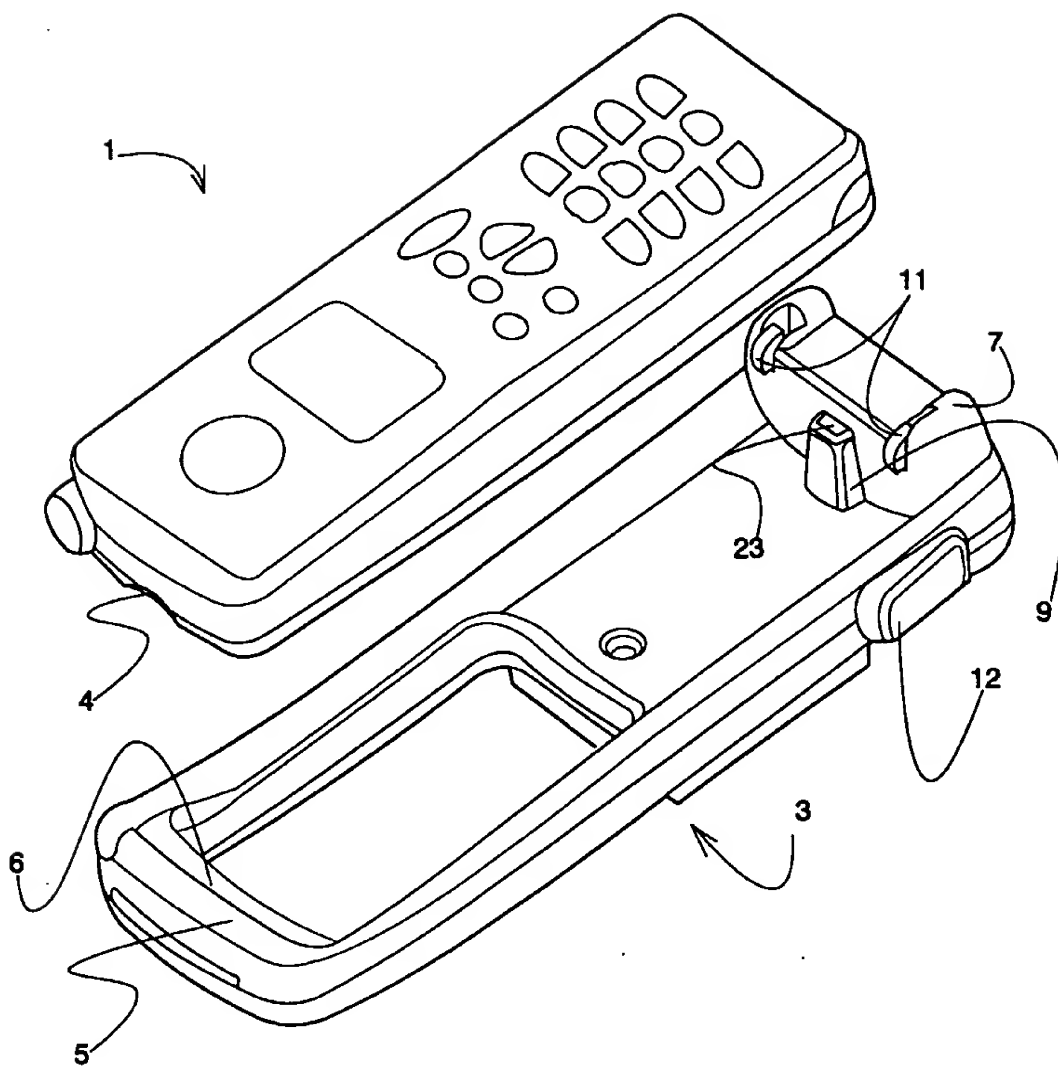


Fig. 2

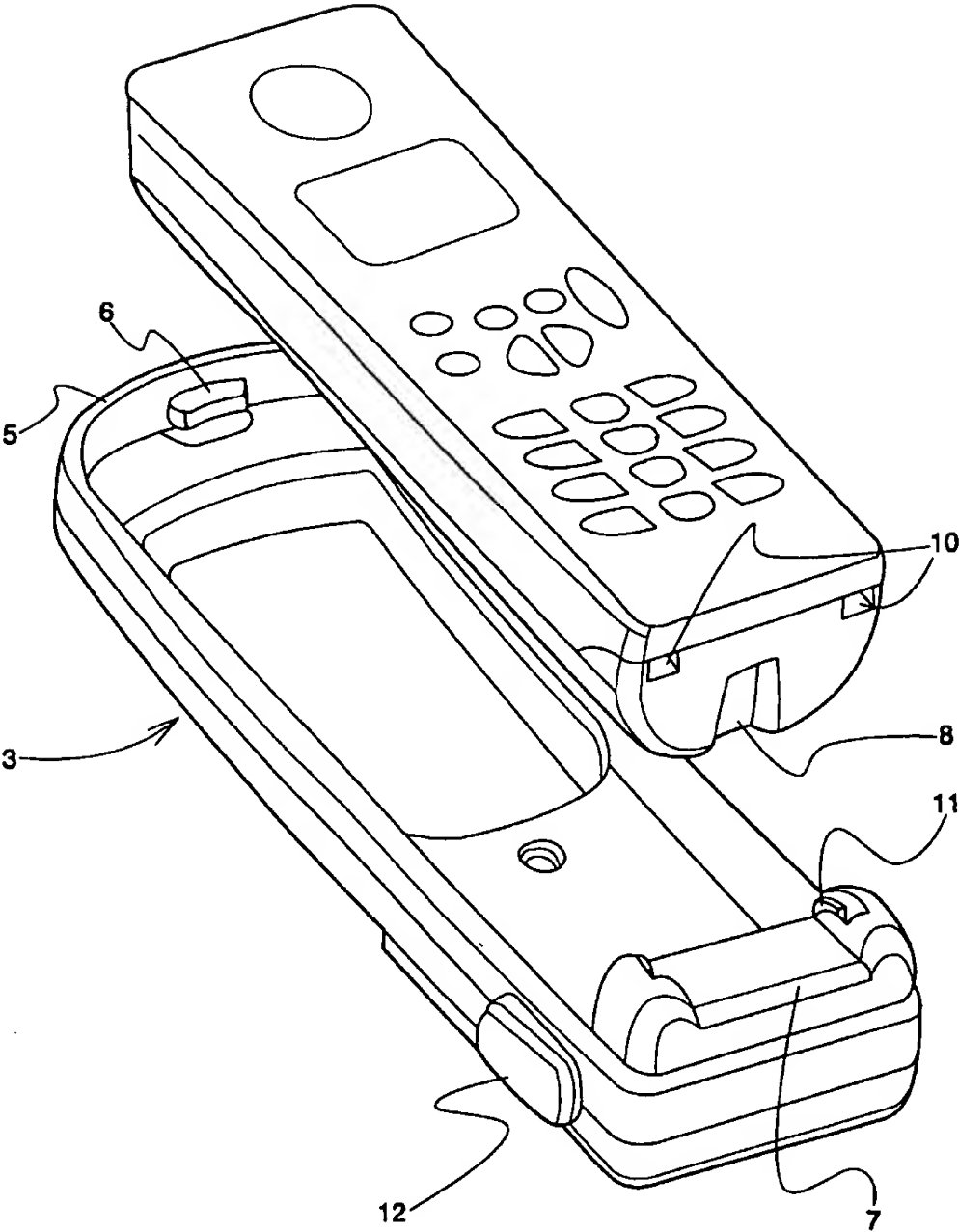


Fig. 3

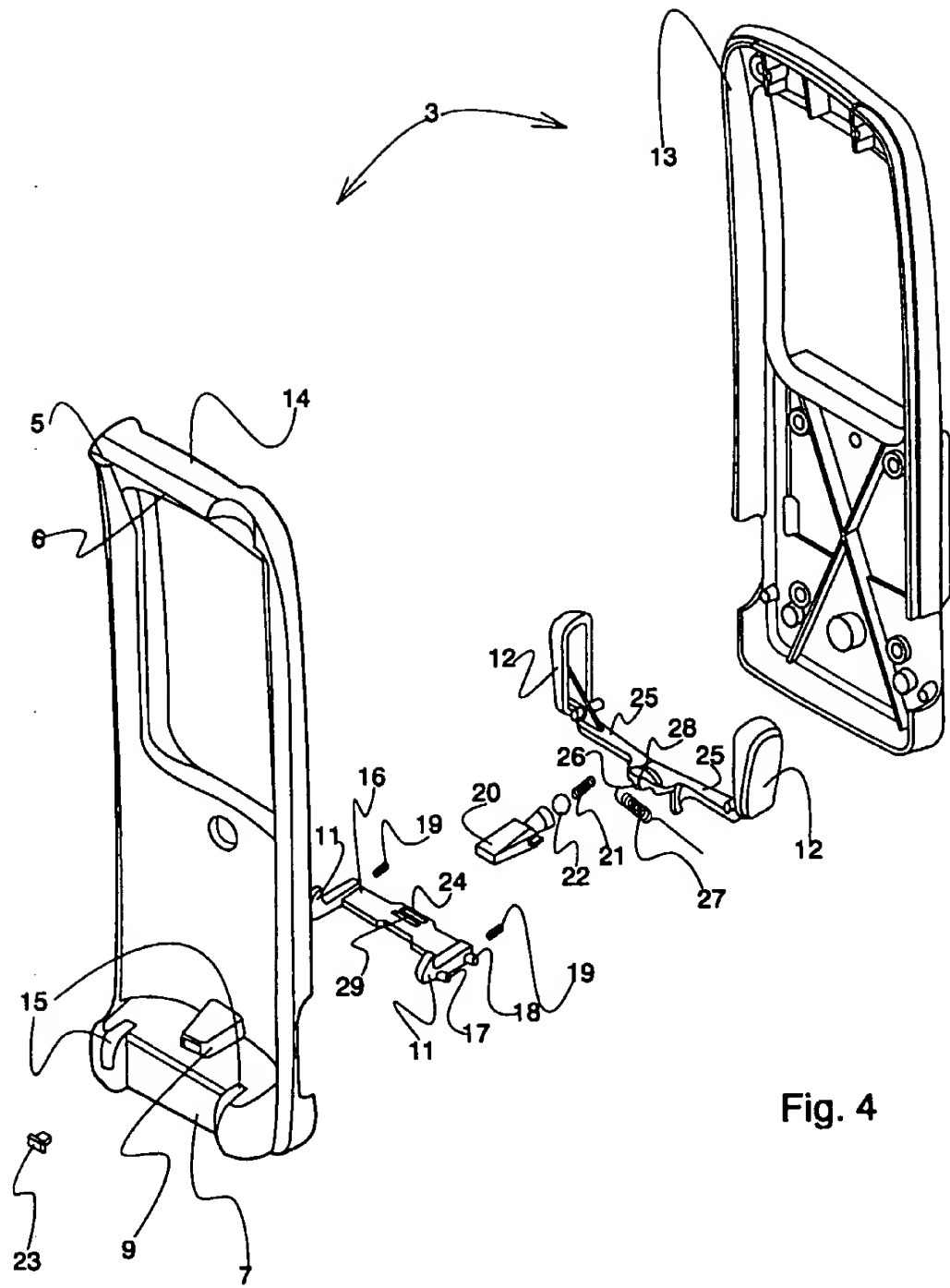


Fig. 4





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# EUROPEAN SEARCH REPORT

Application Number  
EP 96 66 0016

DOCUMENTS CONSIDERED TO BE RELEVANT				
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)	
X	DE-A-40 15 091 (PHILIPS PATENTVERWALTUNG GMBH) * figures 1-3 * * column 1, paragraph 1 *	1-6,9, 10,12	B60R11/02	
A	* column 2, line 11 - column 3, line 24 * ---	7,8		
X	GB-A-2 260 160 (NEC CORPORATION)	1-4,6, 10,12		
A	* figures 1A-2B * * page 1, paragraph 1 * * page 4, line 10 - page 5, line 22 * ---	7-9		
X	DE-A-40 08 618 (PHILIPS PATENTVERWALTUNG GMBH)	1-3,6,9, 10,12		
A	* figures * * claims 1-4 * ---	4,5,7,8		
X	US-A-5 282 246 (YANG)	1-3,6,9, 10,12		
A	* figures * * column 1, line 45 - line 61 * * column 2, line 10 - column 3, line 3 * ---	4,5,7,8		TECHNICAL FIELDS SEARCHED (Int.Cl.6)
X	US-A-4 741 034 (ERRICHELLO ET AL.)	1,6,9, 10,12		B60R H04M
A	* figures 1-3 * * abstract * * column 2, line 6 - column 3, line 52 * ---	2-5,7,8		
Y	PATENT ABSTRACTS OF JAPAN vol. 017, no. 575 (E-1449), 20 October 1993 & JP-A-05 167657 (MATSUSHITA ELECTRIC IND CO LTD), 2 July 1993, * abstract * --- -/--	1-3,6,9, 10,12		
The present search report has been drawn up for all claims				
Place of search THE HAGUE		Date of completion of the search 25 October 1996	Examiner D'sylva, C	
<p><b>CATEGORY OF CITED DOCUMENTS</b></p> <p>X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document</p> <p>T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons Δ : member of the same patent family, corresponding document</p>				

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## EUROPEAN SEARCH REPORT

Application Number  
EP 96 66 0016

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
Y	US-A-5 113 436 (JARVELA ET AL.) * figures * * abstract *	1-3,6,9, 10,12	
A	* column 4, line 34 - column 8, line 14 * ---	4,5,7,8	
A	PATENT ABSTRACTS OF JAPAN vol. 017, no. 444 (E-1415), 16 August 1993 & JP-A-05 095394 (MATSUSHITA ELECTRIC IND CO LTD), 16 April 1993, * abstract *	1-4,9-12	
A	FR-A-2 694 672 (ALCATEL RADIOTELEPHONE S.A.) * figures * * page 1, paragraph 1 * * page 3, line 23 - page 5, line 30 *	1-12	
A	DE-U-94 09 902 (VELAN TELEKOMMUNIKATION CAR-HIFI-ZUBEHÖR GMBH) * figures * * page 4, line 5 - page 6, line 19 * -----	1-4,7-12	
The present search report has been drawn up for all claims			TECHNICAL FIELDS SEARCHED (Int.Cl.6)
Place of search THE HAGUE		Date of completion of the search 25 October 1996	Examiner D'sylva, C
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

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